

2004 GALVESTON BAY INVASIVE SPECIES RISK ASSESSMENT
INVASIVE SPECIES SUMMARY

Created by: Environmental Institute of Houston, University of Houston-Clear Lake
and the Houston Advanced Research Center

Common Name: Asian swamp eel (rice eel, ricefield eel, belut, rice paddy eel, ta-unagi).
Latin Name: <i>Monopterus albus</i> (Syn <i>Monopterus alba</i> , <i>Fluta alba</i> , and <i>Monopterus javanensis</i>)
Category: Aquatic Animal
Place of Origin: “Asia, from northern India and Burma to China, perhaps Asiatic Russia, Japan, and the Indo-Malayan Archipelago (Bailey and Gans 1998); possibly northeastern Australia (Merrick and Schmida 1984) (http://nas.er.usgs.gov/fishes/accounts/synbranc/mo_albus.html).”
Place of Introduction: “A synbranchid tentatively identified as this species was recently discovered in several waterways in peninsular Florida (Nico, 1999). It also is known from three spring-fed impoundments (Chattahoochee River drainage) at the Chattahoochee Nature Center in Roswell, Fulton County, Georgia (Starnes et al. 1998). This species was introduced to Oahu, Hawaii, before 1900 (Brock 1960; Maciolek 1984, Devick 1991a, 1991b) (http://nas.er.usgs.gov/fishes/accounts/synbranc/mo_albus.html).”
Date of Introduction: Around 1990 in the continental United States.
Life History: “Eggs are laid into a bubble nest in shallow water (Smith, 1945; Sterba, 1983). The nest is typically not attached to vegetation but floats freely at the surface. Eggs and young are guarded by one or both parents (Smith, 1945; Sterba, 1983) (http://www.gsmfc.org/nis/nis/Monopterus_albus.html).”
Growth/Size: 100 cm.
<p>Feeding Habits/Diet: “They are nocturnal predators devouring fishes, worms, crustaceans, and other small aquatic animals (Yamamoto and Tagawa, 2000); also feeds on detritus (http://www.fishbase.org/Summary/SpeciesSummary.cfm?genusname=Monopterus&speciesname=albus).</p> <p>This species is of concern given its voracious appetite, generalized feeding habits, and ecological flexibility. Declines in native centrarchids from other areas of the United States have been attributed to this species (Nico, 1999) (http://www.gsmfc.org/nis/nis/Monopterus_albus.html).”</p>
<p>Habitat: “This eel is . . . capable of living out of water for a considerable length of time (Day 1958). The Georgia population has shown some cold tolerance, as evidenced by having survived air temperatures below freezing and ice cover over their pond habitat (Starnes et al. 1998). The distribution, biology, and impacts of Florida populations are being investigated by U.S. Geological Survey researchers in conjunction with university biologists. Georgia specimens were identified by Starnes (http://nas.er.usgs.gov/fishes/accounts/synbranc/mo_albus.html).”</p> <p>“Lives in muddy ponds, swamps, canals and ricefields; burrows in moist earth in dry season surviving for long periods without water (Davidson, 1975). Common in rice paddies (Rainboth, 1996). Occasionally dug out in old taro fields, in Hawaii, long after the field has been drained; more frequently observed in stream clearing operations using heavy equipment to remove large amounts of silt and vegetation where the eels are hidden (Yamamoto and Tagawa, 2000). Found in medium to large rivers, flooded fields and stagnant waters including sluggish flowing canals (Taki, 1978) (http://www.fishbase.org/Summary/SpeciesSummary.cfm?genusname=Monopterus&speciesname=albus).”</p>
Attitude (aggressive, etc.): “Because they are generalized predators, this species is a potential threat to native fishes, frogs, and aquatic invertebrates. In both Georgia and Florida there is concern that the species will spread to adjacent water bodies. The Georgia impoundments where this eel has been taken are connected to the Chattahoochee River (http://nas.er.usgs.gov/fishes/accounts/synbranc/mo_albus.html).”
Physical Description: “Anguilliform body; no scales; no pectoral and pelvic fins; dorsal, caudal and anal fins confluent and reduced to a skin fold; gill openings merged into single slit underneath the head (Kottelat, 1998). Rice paddy eels are red to brown with a sprinkling of dark flecks across their backs; large mouths and small eyes (Yamamoto and Tagawa, 2000) (http://www.fishbase.org/Summary/SpeciesSummary.cfm?genusname=Monopterus&speciesname=albus).”

Management Recommendations / Control Strategies: include references for existing site-specific strategies

Carter, Patricia A.; Shawn K. Alam. [No date] Management Options for Asian Swamp Eels *Monopterus albus* in the Southeastern United States. US Fish and Wildlife Service.

http://www.ecu.edu/org/afs/st_louis/absaquaticinvaders/r953151075-60.htm

”Abstract #: 953151075-60: Nonindigenous aquatic nuisance species are causing significant economic and ecological problems throughout the United States. A new invader has infiltrated the Southeast. Four populations of Asian swamp eel (*Monopterus albus*) have been discovered in the southeastern United States. Three of these are in Florida, with a fourth population located near Atlanta, Georgia. Left unchecked, the species could impact the ecological balance of aquatic ecosystems, including those encompassing Everglades National Park, Big Cypress National Preserve, by preying on large numbers of aquatic invertebrates and larval fishes. A multi-agency workgroup has been formed to combat the spread of this exotic invader. The focus of current efforts is centered around research needs and implementation of a comprehensive strategy to eradicate or control the spread of this species. Researchers and managers believe that it may be possible to control dispersal through a combination of electric barriers, vegetation removal, and trapping. An Asian swamp eel management plan is currently under development. The Plan outlines measures that can be taken to prevent the continued spread of Asian swamp eel populations in Florida and Georgia and identifies the roles and responsibilities of affected agencies.”

References (includes journals, agency/university reports, and internet links):

1. http://nas.er.usgs.gov/fishes/accounts/synbranc/mo_albus.html. USGS Nonindigenous Aquatic Species Profiles.
2. <http://www.fishbase.org/Summary/SpeciesSummary.cfm?genusname=Monopterus&speciesname=albus>. Fish Base. FishBase, International Center for Living Aquatic Resources Management].
3. <http://www.invasivespecies.gov/profiles/swampeel.shtml>. Invasive Species Gov. Species Profiles.
4. http://www.ecu.edu/org/afs/st_louis/absaquaticinvaders/r953151075-60.htm. Carter, Patricia A.; Shawn K. Alam. [No date] Management Options for Asian Swamp Eels *Monopterus albus* in the Southeastern United States. US Fish and Wildlife Service.
5. http://www.gsmfc.org/nis/nis/Monopterus_albus.html. Gulf of Mexico Program Non-Indigenous Species Profiles.
6. Davidson, A., 1975 Fish and fish dishes of Laos. Imprimerie Nationale Vientiane. 202 p.).
7. Rainboth, W.J., 1996 Fishes of the Cambodian Mekong. FAO Species Identification Field Guide for Fishery Purposes. FAO, Rome, 265 p
8. Yamamoto, M.N. and A.W. Tagawa, 2000 Hawai'i's native and exotic freshwater animals. Mutual Publishing, Honolulu, Hawaii. 200 p
9. Taki, Y., 1978 An analytical study of the fish fauna of the Mekong basin as a biological production system in nature. Research Institute of Evolutionary Biology Special Publications no. 1, 77 p. Tokyo, Japan
10. Kottelat, M., 1998 Fishes of the Nam Theun and Xe Bangfai basins, Laos, with diagnoses of twenty-two new species (Teleostei: Cyprinidae, Balitoridae, Cobitidae, Coidae and Odontobutidae). Ichthyol. Explor. Freshwat. 9(1):1-128.).
11. For additional references, see bibliography.

Available Mapping Information:

1. USGS Nonindigenous Aquatic Species Profiles. http://nas.er.usgs.gov/fishes/accounts/synbranc/mo_albus.html